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I, KAY WARD, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 1830 for a patent by HANS H. SCHMIDT filed on 27 July 1999.

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PROVISIONAL SPECIFICATION

Applicant:

HANS H. SCHMIDT

Invention Title:

CONTAINER HANDLING APPARATUS OR CRADLE

The invention is described in the following statement:

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CONTAINER HANDLING APPARATUS OR CRADLE

20 This invention relates to a container handling
apparatus or cradle, and more particularly an apparatus or
cradle adapted to be interconnected to a shipping container
whereby the container can be shifted onto and off the
trailer(tray) of a truck at a shipping port, rail terminal
and/or factory.

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 Manipulation of containers is typically done by
using fork lift trucks, side-lifters, mobile cranes or
accessories such as portable lifting devices in the form of
jigs and jacks which can be located on-site or carried with
30 a container.

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 Fork lift trucks are very expensive equipment and
are usually only available at well equipped sites, and are
not necessarily available at many sites where containers
35 need to be loaded onto and off the trays or trailers of
road transports/trucks. Side-lifters are also only
available at well equipped sites and due to their manner of

operation require space equivalent to three times the width of the container. Mobile cranes on the other hand are also very costly installations and normally only available at sites dedicated to the handling of large numbers of containers, such as at a shipping port.

As an alternative to fork-lift trucks, side-lifters and mobile cranes, portable lifting devices have been proposed, and such a lifting device is disclosed in International patent publication WO92/19527. However, the weight of a fully loaded container with such lifting devices leads to instability when supported on a number of separate jacks at each corner of the container, and thus such devices are not a totally satisfactory solution to the problem of lifting and manoeuvring containers, whilst in addition, the lifting devices require the services of a fork lift truck to position the devices for attachment to a container.

Other lifting devices that are known utilise a rigid chassis having a plurality of lifting jacks, and examples of these are disclosed in US patent publications nos. 3460697, 4053073, 3520433, 4522550 and 3152709. However, none of the disclosures in these publications provide a container handling system adapted to move a container, in particular the movement of a container once it has been elevated for loading onto transport. The ability to move containers small distances is a particularly important problem which has not been addressed by any of the prior art devices or systems presently available to handle containers. Furthermore, none of the known devices and systems are able to be attached to the top of the container such that a single container handling system or cradle can be used on multiple containers. An overhead crane can be used to fit such devices and systems to a container thereby avoiding the need for fork lifts or other types of mobile cranes.

Therefore, problems associated with loading and unloading containers onto and off the trays or trucks is only satisfactorily accomplished at very well equipped sites by the use of sophisticated and highly costly dedicated equipment. Moreover, the ability to manipulate, that is manoeuvre, containers small distances is only available with the use of the same equipment used for loading and unloading the containers.

In accordance with the present invention there is envisaged a container handling apparatus or cradle including a main frame adapted to be moved laterally from one side of a container and over said container, ram means to raise and lower said main frame, means to engage the top and bottom of said container to attach said container to said frame, and means to allow said apparatus or cradle to be moved around.

Preferably the means to allow said apparatus or cradle to move around are wheels forming part of said apparatus of cradle, and/or alternatively said means is a fork lift truck or the like, and said apparatus or cradle further includes means for engagement by the tines of said fork lift truck.

One preferred embodiment of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the apparatus or cradle of this preferred embodiment of the invention and carrying a shipping container;

Figure 2 is a side elevational view of the apparatus or cradle of Figure 1;

Figure 3 is an end elevational view of the apparatus or cradle of Figures 1 and 2 carrying a shipping container out of alignment with the tray of a truck; and

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Figure 4 is an end elevational view similar to that of Figure 3 having been adjusted to align the shipping container with the tray of the truck.

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In this preferred embodiment of the invention the apparatus, hereinafter referred to as a container cradle 10, is adapted to be clipped onto a shipping container C. The cradle 10 has a main frame, generally indicated as 11, and includes trapezoidal shaped end frames 12, having upwardly angled frame members 12a, vertical frame members 12b, and upper and lower horizontal frame members 12c and 12d respectively.

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The lower horizontal frame members 12d are tubular in configuration, and received therethrough snugly fitting ram support beams 30 on which the main frame 11 as a whole can be moved laterally within the cradle in a manner to be later described. The main frame is completed by longitudinally extending beams 13 attached to the end frames via stub tubes 18 which can come in various sizes and which can be interchanged to accommodate different lengths of containers. The beams 13 consist of two parallel longitudinally extending top beams 13a and a single longitudinally extending bottom beams 13b at one side of the main frame, with the bottom of the other side of the main frame being open to allow the main frame to be laterally moved over the top of the container C. Location pins 14a and locking devices 14b at the top and bottom of the main frame engaged with apertures within the container, whilst on the opposite side of the main frame locking device pillars 15 extend downwardly from beneath the end frames 12, and to which they are connected by connecting

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brackets 16 and which receive further locking devices 17 which are movable longitudinally of the main frame top engage in apertures at the bottom end of the container at the open side of the main frames.

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The ram support beams 30 carry rams 19 at either end, and at each of the four corners of the cradle. The cylinders 19a of the rams 19 extend upwardly from the ends of the beams 12 whilst the ram pistons 19b extend
10 downwardly from the ends of the beams, and in this embodiment they carry at their lower ends yokes 20 carrying ground engaging wheels 21. In addition, the yokes may be pivotable about the vertical axes of the pistons for the purposes of allowing the cradle to be steered whilst being
15 rolled around a site either with or without a container supported within the cradle. The cradle may be manually rolled around and steered on the wheels 21, or alternatively the cradle may be towed by a fork lift truck or the like, or even in another alternative embodiment the
20 wheels can be self-propelled and self-steered.

A pair of parallel extending tubular forklift tine receiving members 22 are provided midway along the lengths of the longitudinally extending top beams 13a of
25 the main frame, and extending between the top beams, and which receive the tines T of a fork lift truck F as shown in Figure 1. The positions of the tine receiving members 22 relatively to each other may be adjustable to accommodate different tyne spacings when required depending
30 on the forklift truck to be utilised to manoeuvre the cradle with or without a container supported therein.

The cradle either loaded or unloaded can be manoeuvred around a site on its wheels as described above,
35 or by the fork lift truck F, or a combination of both, or in an alternative embodiment when the rams do not have ground engaging wheels, but merely ground engaging base

plates, manoeuvring would be accomplished only with the use of the fork lift truck.

With reference to Figure 2 of the drawings, when
5 unloading a container C from the tray of a truck TT, the
cradle, with rams extended, may be rolled over the top of
the container on the truck tray or alternatively positioned
over the top of the container by the fork lift truck F.
The rams of the fork lift truck are then lower the cradle
10 onto the top of the container and the location pins 14a and
locking devices 14b and 17 engaged with the container.
Twist locks (not shown) are disengaged from locking lugs
TTa carried by the tray of the truck, whereafter the rams
are again extended to lift the container from the tray of
15 the truck. The cradle with the container supported therein
is rolled longitudinally relative to the truck tray, or the
truck can be driven away from beneath the container, which
will be necessary in the case where the cradle is not
mounted on wheels but merely mounted on ground engaging
20 base plates. Once lifted up from, and then away from, the
truck tray the container can then be lowered to the ground
by retracting the rams 19.

In order to load the container C onto the tray of
25 the truck TT, the sequence of events described above for
unloading the container are reversed, with an additional
event in the sequence of events being performed if
necessary when the container is not correctly aligned with
the truck tray, and which will now be described
30 particularly with reference to Figures 3 and 4 of the
drawings. In order to deal with such misalignment,
horizontally orientated hydraulic rams 31 are coupled
between the rams supporting beams 30 and the vertical frame
members 12b of the end frames 12, and can be extended and
35 retracted to shift the position of the main frame along the
length of the ram support beams. With reference to Figures
3 and 4 of the drawings, in Figure 3 it will be apparent

that the container C is not laterally aligned with the tray of the truck and in those circumstances, the horizontally orientated rams 31 are extended to laterally shift the position of the main frame and therefore the container
5 within the cradle as a whole to the position shown in Figure 4 where the container is aligned with the tray of the truck and can therefore be lowered correctly onto the tray of the truck.

10 The cradle, when required to be moved from one site to another for use at different sites for use with the same or different containers, may be modular in construction whereby sections of the cradle can be disassembled and carried on top of the container as it is
15 trucked from one site to another, or the modular sections can be transported separately on a different truck. Alternatively, connections between the various components of the cradle, including those of the main frame 11 and the connections between the hydraulic raising and lowering rams
20 19 and the rams support beams 12, may, with appropriate locking devices, be hinge connections whereby the cradle may be collapsible to a substantially flat condition for transportation, rather than being disassembled.

25 The hydraulics for the cradle may be provided by an onboard power-pack P, or alternatively an external power-pack delivered to, or already existing at, the site. It is envisaged that with most loaded containers a standard fork lift truck with a 3 tonne, or above, capacity will be
30 sufficient if a fork lift truck is required.

The cradle of this preferred embodiment of the invention when not used for handling and manoeuvring containers, can also be used for other purposes, such as a
35 movable work platform, whilst as it can be raised up to 1800mm above ground level it can also be used for servicing and repair of equipment and machinery, for example, repairs

to the undersides of containers.

5 Since modifications within the spirit and scope
of the invention may readily be effected by persons skilled
within the art, it is to be understood that this invention
is not limited to the particular embodiments described by
way of example hereinabove.

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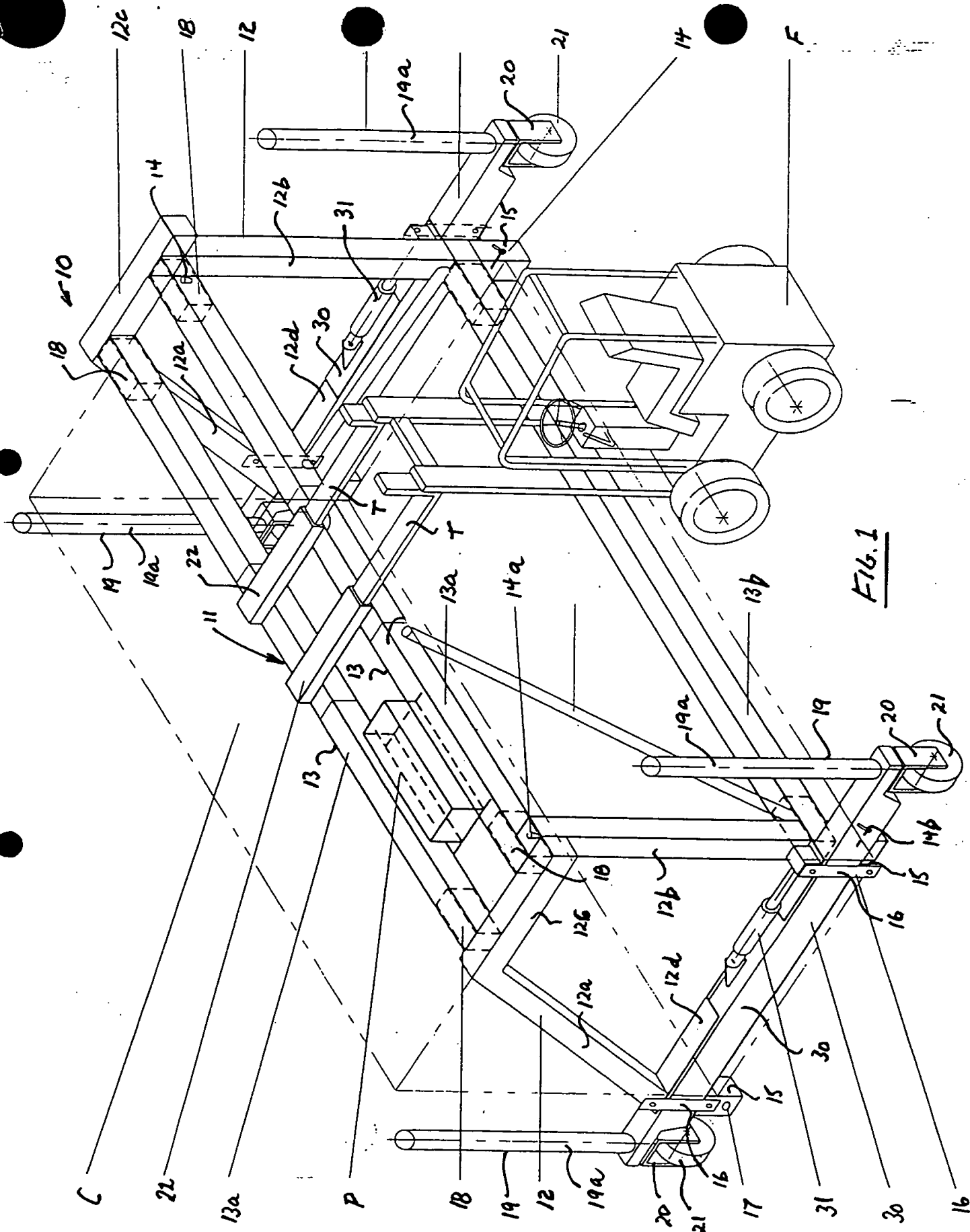
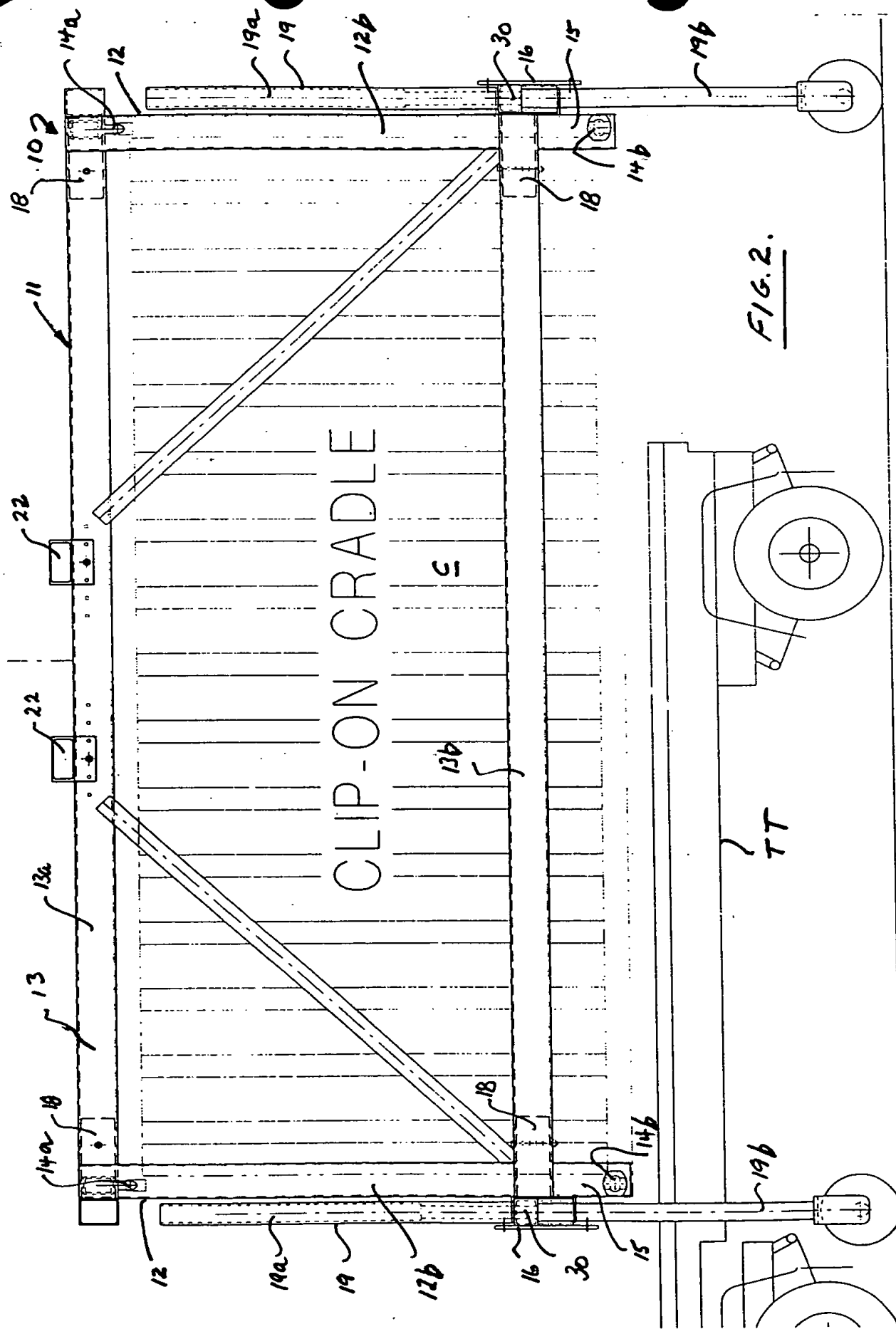
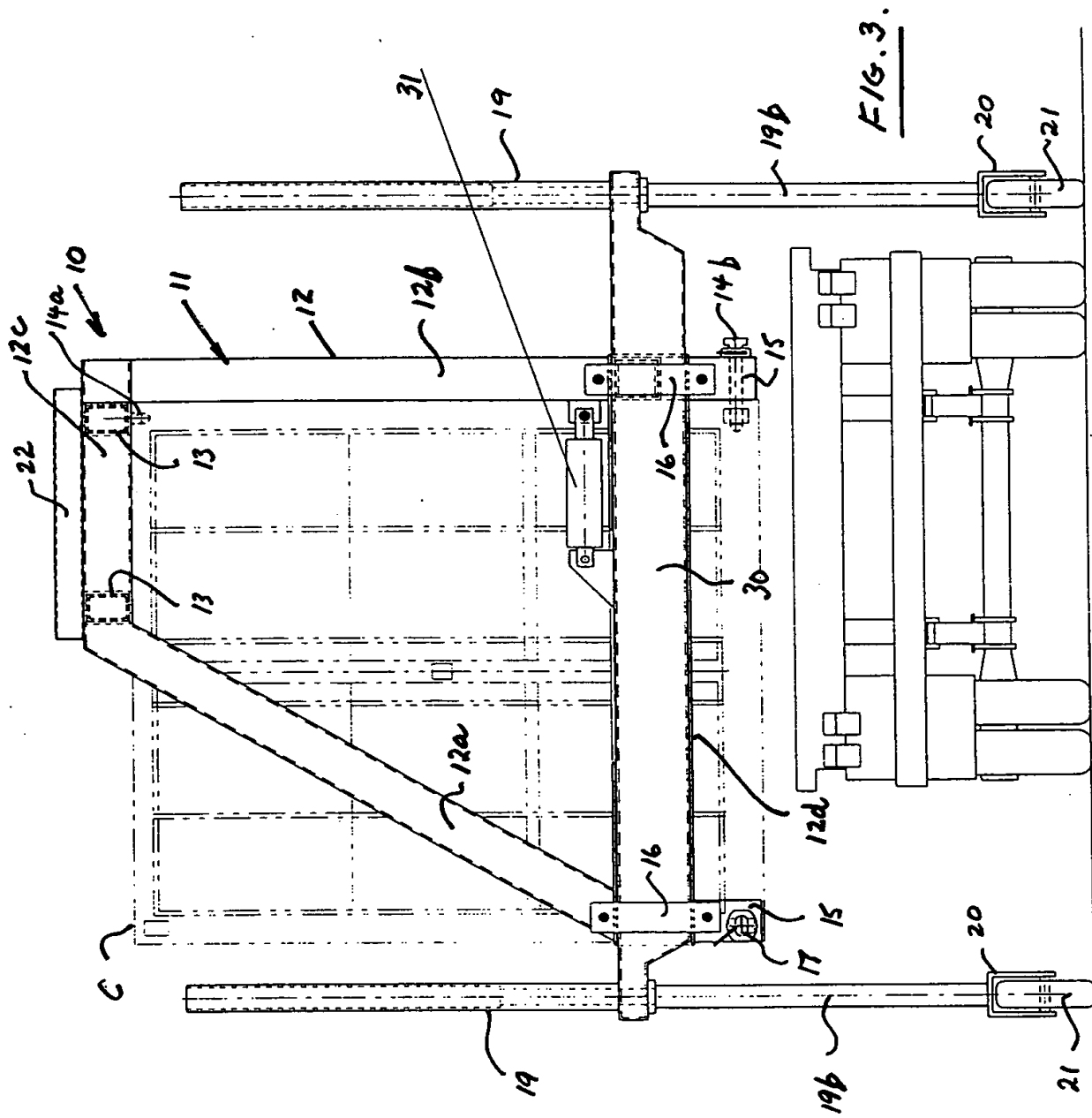


FIG. 1

ISOMETRIC OF CLIP-ON CRADLE



FRONT VIEW OF CLIP-ON CRADLE WITH CONTAINER OVER MOVING TRUCK



END VIEW OF CLIP-ON CRADLE WITH CONTAINER OUT OF ALIGNMENT

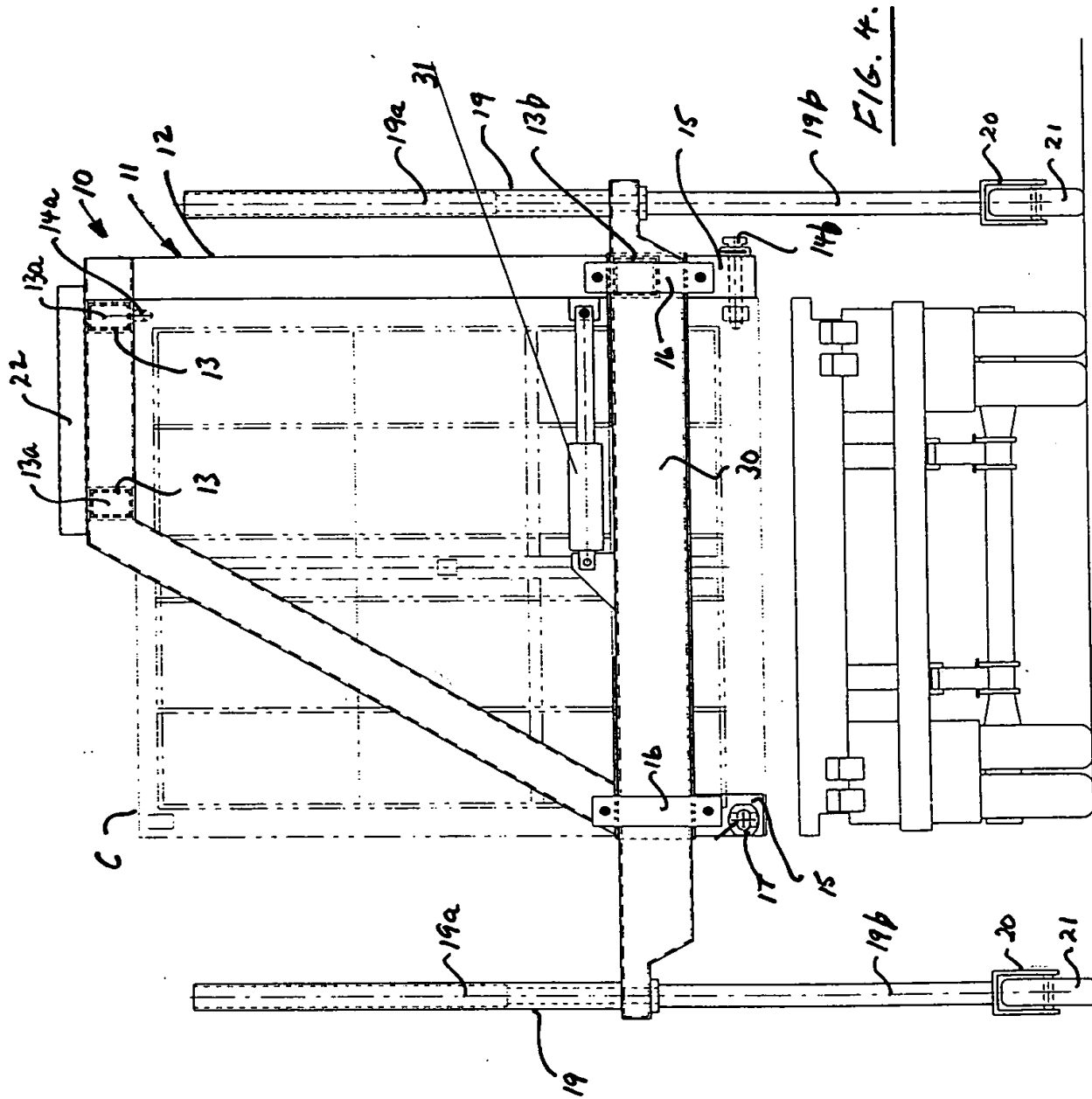


FIG. 4.

END VIEW OF CLIP-ON CRADLE WITH CONTAINER IN POSITION FOR LOWERING ONTO TRUCK